

Manual of Petroleum Measurement Standards Chapter 6.4A

Metering Assemblies—Lease Automatic Custody Transfer (LACT) Systems

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Foreword

Revision of API *MPMS* Chapter 6, *Metering Assemblies*, First Edition (202X) is ongoing. The revision supersedes all existing API *MPMS* Chapter 6 standards with the following four separate standards:

- 1) API *MPMS* Chapter 6.1A, *Metering Assemblies—General Considerations*, First Edition (2021)
- 2) API *MPMS* Chapter 6.2A, *Truck and Rail Loading and Unloading Measurement Systems*, First Edition (2021)
- 3) API *MPMS* Chapter 6.3A, *Pipeline and Marine Loading/Unloading Measurement Systems*, First Edition (2021)
- 4) API *MPMS* Chapter 6.4A, *Lease Automatic Custody Transfer (LACT) Systems*, First Edition (2023)

Three 6.XA standards have been published and supersede the previous standards as follows:

- 1) API *MPMS* Chapter 6.1A, *Metering Assemblies—General Considerations*, First Edition (2021), is a new standard that specifies the common requirements for all metering systems and does not supersede any other API *MPMS* Chapter 6 standards.
- 2) API *MPMS* Chapter 6.2A, *Truck and Rail Loading and Unloading Measurement Systems*, First Edition (2021), supersedes API *MPMS* Chapter 6.2, *Loading Rack Metering Systems*, Third Edition (2004), which has been withdrawn.
- 3) API *MPMS* Chapter 6.3A, *Pipeline and Marine Loading/Unloading Measurement Systems*, First Edition (2021), supersedes API *MPMS* Chapter 6.5, *Metering Systems for Loading Marine Bulk Carriers*, Second Edition (1991), and API *MPMS* Chapter 6.6, *Pipeline Metering Systems*, Second Edition (1991), and Section 6.3.5 supersedes API *MPMS* Chapter 6.7, *Metering Viscous Hydrocarbons*, Second Edition (1991), all of which have been withdrawn.

Upon publication of this document:

- 4) API *MPMS* Chapter 6.4A, *Metering Assemblies—Lease Automatic Custody Transfer (LACT) Systems*, First Edition, supersedes API *MPMS* Chapter 6.1, *Lease Automatic Custody Transfer (LACT) Systems*, Second Edition (1991), including Addendum 1, August 2020, and Section 5.1.2 of Chapter 6.4A supersedes API *MPMS* Chapter 6.7, *Metering Viscous Hydrocarbons*, Second Edition (1991), all of which have been withdrawn.

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The verbal forms used to express the provisions in this document are as follows.

Shall: As used in a standard, “shall” denotes a minimum requirement to conform to the standard.

Should: As used in a standard, “should” denotes a recommendation or that which is advised but not required to conform to the standard.

May: As used in a standard, “may” denotes a course of action permissible within the limits of a standard.

Can: As used in a standard, “can” denotes a statement of possibility or capability.

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Generally, API standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. A one-time extension of up to two years may be added to this review cycle. Status of the publication can be ascertained from the API Standards Department, telephone (202) 682-8000. A catalog of API publications and materials is published annually by API, 200 Massachusetts Avenue, Suite 1100, Washington, DC 20001.

Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, Suite 1100, Washington, DC 20001, standards@api.org.

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Introduction

This standard serves as a guide in the selection, installation, and operation of lease automatic custody transfer (LACT) metering systems. This standard does not endorse or advocate the preferential use of any specific type of metering system or metering system components.

In general, metering system installations have to meet certain fundamental requirements, including proper selection, sizing, and installation of metering system components, as well as inclusion of adequate protective and readout devices. Descriptions of metering system components are included either in this standard or other API *MPMS* chapters.

Parts of Chapter 6 describe metering system design, selection, and operation. Chapter 6.1A describes the general considerations applicable to all metering systems, and shall be consulted together with Chapter 6.4A (this section) when designing, selecting, and operating LACT measurement systems. When aspects are covered under the scope of other chapters of the *API Manual of Petroleum Measurement Standards (MPMS)*, and to avoid replication and conflict, they are not covered by this standard. In these cases, this standard provides limited information and refers the user to those chapters.

For guidance on the design, selection, and operation of truck and rail loading and unloading systems, including truck-mounted meters, refer to Chapter 6.2A. For guidance on the design, selection, and operation of pipeline and marine loading/unloading metering systems, refer to Chapter 6.3A.

Metering Assemblies—Lease Automatic Custody Transfer (LACT) Systems

1 Scope

This standard is part of a set of documents that details the minimum requirements for metering systems in single-phase liquid applications. This standard (Chapter 6.4A) details the specific requirements for the design, selection, and operation of lease automatic custody transfer (LACT) metering systems.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any addenda) applies.

API MPMS Chapter 4 (all sections), *Proving Systems*

API MPMS Chapter 5 (all sections), *Metering*

API MPMS Chapter 6.1A, *Metering Assemblies—General Considerations*

API MPMS Chapter 7.4, *Temperature Determination—Dynamic Temperature Measurement*

API MPMS Chapter 8.1, *Standard Practice for Manual Sampling of Petroleum and Petroleum Products*

API MPMS Chapter 8.2, *Standard Practice for Automatic Sampling of Petroleum and Petroleum Products*

API MPMS Chapter 8.3, *Standard Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products*

API MPMS Chapter 9.4, *Continuous Density Measurement Under Dynamic (Flowing) Conditions*

API MPMS Chapter 9 (all sections), *Density Determination*

API MPMS Chapter 10 (all sections), *Sediment and Water Determination*

API MPMS Chapter 21.2, *Electronic Liquid Volume Measurement Using Positive Displacement and Turbine Meters*

3 Terms, Definitions, Abbreviations, and Acronyms

3.1 Terms and Definitions

For the purposes of this document, the following terms and definitions apply. Terms of more general use can be found in API MPMS Chapter 1, *Online Terms and Definitions Database*.

3.1.1

lease automatic custody transfer (LACT) system

An arrangement of equipment designed for the unattended custody transfer of liquid hydrocarbons from producing leases to the transporting carrier. Provides the means for determining quantity and quality and the means for fail-safe and tamperproof operation.

NOTE Sometimes referred to as a “LACT unit.”